

DISCUSSION OF THE AMENDMENT

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2006/0166085, when discussing the application description, both in this section and in the Remarks section, *infra*, rather than to page and line of the specification as filed.

Claim 1 has been amended by limiting the lithium ion conducting material, as supported in the specification at paragraphs [0040]-[0050]. (Since particular materials have been inserted, the prefixes “inorganic” and “which may also contain organic groups” are now superfluous.)

Claims 4 and 6 have been amended to be consistent with the above-discussed amendment to Claim 1. Claims 5, 8-13 and 16 have been canceled.

New Claims 26-33 have been added. Claims 26-30 are each directed to a species added to above-amended Claim 1. Claim 31 is supported by Inventive Examples 1 and 4 of the specification. Claim 32 is supported by Inventive Example 2 of the specification. Claim 33 is supported by Inventive Example 5 in the specification.

No new matter is believed to have been added by the above amendment. Claims 1-4, 6, 7, 14, 15 and 17-33 are now pending in the application.

REMARKS

The rejections:

under 35 U.S.C. § 102(b) of Claims 1-12 and 14-21 as anticipated by WO 99/62620, corresponding to US 6,620,320 (Hying et al), in view of US 5,254,416 (Kubota) and US 5,411,820 (Chaloner-Gill), and

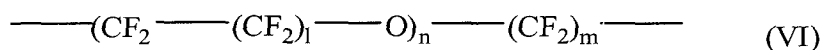
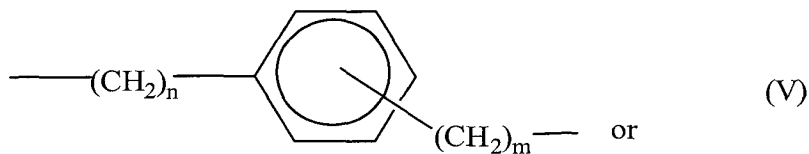
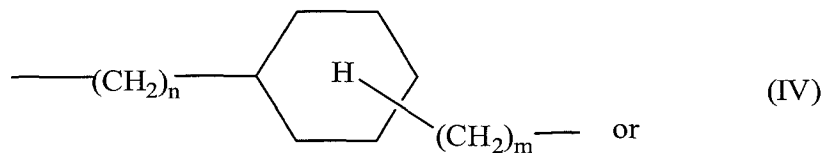
under 35 U.S.C. § 103(a) of Claim 13 as unpatentable over Hying et al in view of US 6,828,065 (Munshi), and of Claims 22-25 as unpatentable over Hying et al in view of US 5,795,679 (Kawakami et al),

are respectfully traversed.¹

As recited in above-amended Claim 1, an embodiment of the present invention is a separator for high power lithium batteries comprising a sheetlike flexible substrate having a multiplicity of openings and having a porous inorganic electrically insulating coating on and in said substrate, said coating closing the openings in the substrate, the material of said substrate being selected from non-woven electrically nonconductive polymeric fibers and said inorganic electrically insulating coating comprising particles, wherein the separator is an electrical insulator and has lithium ion conducting properties without the presence of an electrolyte and wherein the separator comprises at least one lithium ion conducting material and which lithium ion conducting material is chemically bonded to the inorganic coating, wherein the lithium ion conducting material is an organosilicon compound of formula $[(R^1O)_3Si-R^2]M^+$, wherein R^1 is methyl or ethyl, M is either H or Li, and R^2 is a bis(perfluoromethylsulfonyl)amide group of formula $-CF_2-SO_2-N-SO_2-CF_3-$; or an organosilicon compound of formula $[(RO)_y(R^4)_z]_aSi-\{R^3-SO_3^-\}_bM^+$ or $[(RO)_y(R^4)_z]Si-R^3-$

¹ That the prior art, i.e., Kubota and Chaloner-Gill, is not listed in the statement of the rejection is irrelevant; reliance thereon is all that is necessary. "Where a reference is relied on to support a rejection, whether or not in a 'minor capacity,' there would appear to be no excuse for not positively including the reference in the statement of rejection." *In re Hoch*, 428 F.2d 1341, 166 USPQ 406, 407 n.3 (CCPA 1970). See also MPEP 706.02(j).

$\text{PR}^5\text{O}_2\text{]}M^+$, wherein R^3 is a linear or branched alkylene group having 1 to 12 carbon atoms, a cycloalkyl group having 5 to 8 carbon atoms or a unit of formula



wherein 1, n, and m are respectively each a number from 0 to 12, M is an H^+ or a lithium ion, y is a number between 1 and 3, z is a number between 0 and 2, $y+z=3$, a is a number between 1 and 3, $b=4-a$, R and R^4 are identical or different and are methyl, ethyl, propyl, butyl or H, and R^5 is H, OH, OM or R^3 ; or $\text{Li}_2\text{Zr}(\text{O}_3\text{P-R-SO}_3)_2$ or $\text{Li}_4\text{Zr}(\text{O}_3\text{P-R-PO}_3)_2$, wherein R is a perfluorinated, partly fluorinated or nonfluorinated aryl or alkyl chain having 1-12 carbon atoms.

As previously submitted, the difference between Hying et al and the present invention is that the present invention includes at least one lithium ion conducting inorganic material which may also contain organic groups and which material is chemically bonded to the inorganic coating. As excerpted above, the present claims now require lithium ion conducting materials neither disclosed nor suggested by Hying et al. Nor do Kubota or Chaloner-Gill disclose or suggest such materials.

Nor does Munshi disclose that flexibility of a separator is dependent on the thickness thereof. Munshi simply discloses that for Munshi's purposes, a thickness from about 0.5 to 50 microns renders his material flexible.

Nor does Kawakami et al suggest using the ion-conducting materials of Hying et al as separators in batteries, including lithium batteries, which batteries are not disclosed in Hying

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et al. As previously stated, it is only with the present disclosure as a guide that one of ordinary skill in the art would combine Kawakami et al with Hying et al. But even if combined, the result would not be the presently-claimed invention.

For all the above reasons, it is respectfully requested that the rejections be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

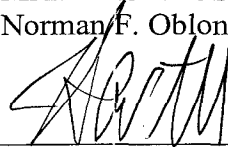
Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Harris A. Pitlick
Registration No. 38,779